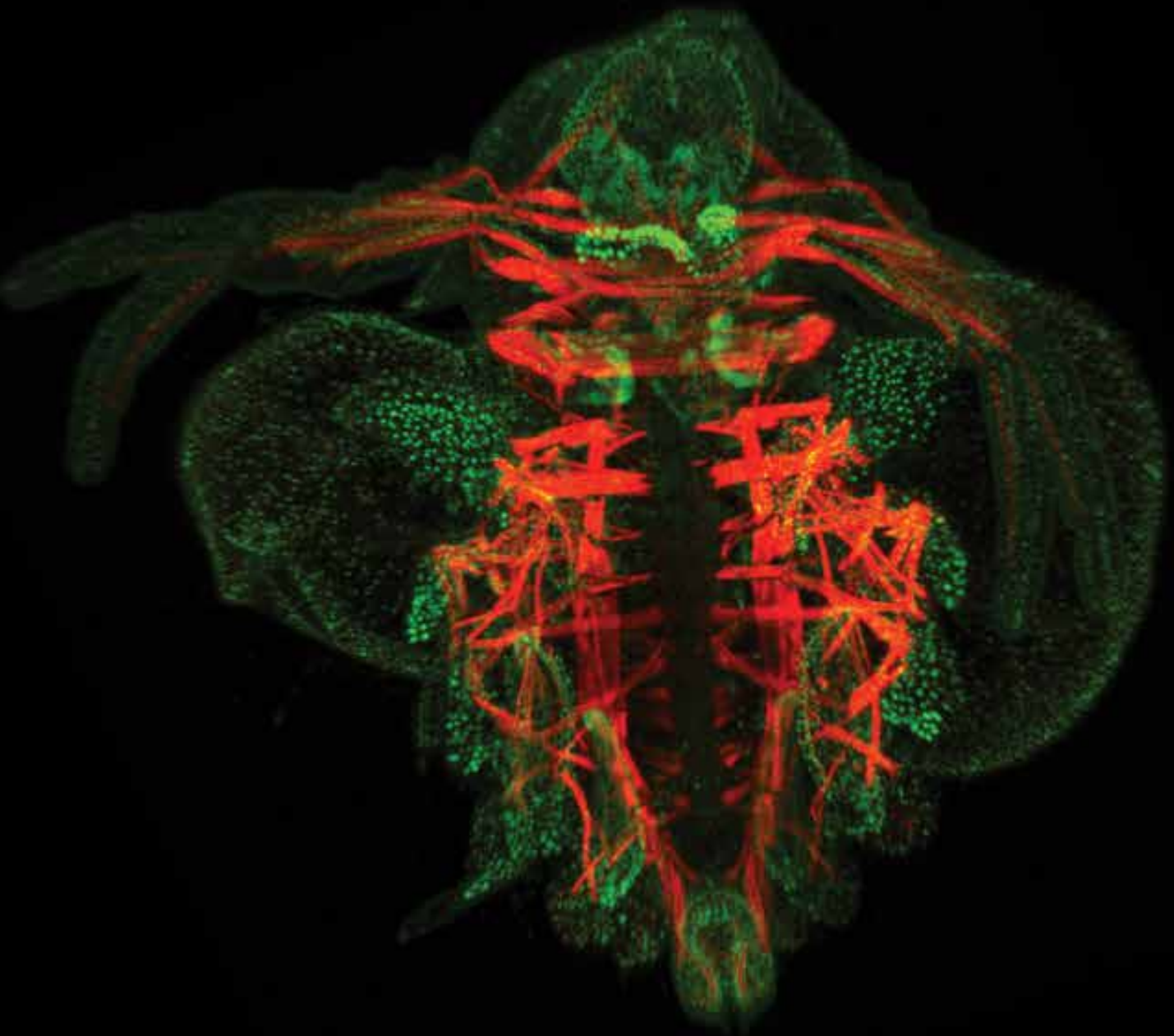




Queen Mary
University of London

**Queen Mary University
of London
Core Facilities**



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CORE FACILITIES

Core Facilities at Queen Mary University of London are staffed by experienced staff who are able to help with experimental selection, design, troubleshooting and data interpretation. While in some facilities, equipment is on offer for researchers to use, other facilities run a service where they will carry out your experiment for you according to a service level agreement. However, all facilities encourage interaction between users and members of the core facility.

SMD, SBCS and SEMS Core Facilities are located at the following sites: Blizard Institute at Whitechapel (SMD), Barts Cancer Institute (BCI) and the William Harvey Research Institute (WHRI) in the John Vane Science Centre at Charterhouse Square (SMD), and the Schools of Biological and Chemical Sciences (SBCS) and Engineering and Materials Science (SEMS) at Mile End.

Facilities are listed according to techniques:

Analytical Services/Submolecular Sciences

- Analytical Services
- Electron Paramagnetic Resonance (EPR)
- Environmental Sciences
- Mass Spectrometry Facility
- NanoVision
- Nuclear Magnetic Resonance (NMR)
- X-ray Diffraction Facility
- Lipid Mediator Metabololipidomics

Nucleic Acids/Genetics/Genomics

- BCI Bioinformatics Unit
- Genome Centre
- Protein Production Facility
- SBCS Informatics Services
- siRNA Screening Facility
- NanoChannel Whole Genome Mapping

Protein Analysis/Biochemistry

- EPR
- Mass Spectrometry Facility
- NanoVision
- NMR
- Protein Production Facility
- X-ray Diffraction Facility

Cell and Molecular Imaging

- Blizard Advanced Light Microscopy Core Facility (BALM)
- Confocal Microscopy in the SBCS
- In vivo Molecular Imaging
- Microscopy in the BCI
- NanoVision
- Transmission Electron Microscopy Facility (TEM)

Whole Cell/Tissue

- Breast Cancer Tissue Bank
- Flow Cytometry
- Pathology
- Zebrafish Facility

ANALYTICAL SERVICES/ SUBMOLECULAR SCIENCES

Analytical Services – Mile End (SBCS)

For the characterization of small molecules, macromolecules (peptides, proteins, nucleic acids, and polymers), bacteria, materials, metabolomics, proteomics, genomics, and lipidomics. Also for the quantitative determination of chemical elements.

- High pressure liquid chromatography (HPLC)
- Liquid chromatography mass spectrometry (LC/MS)
- Gas chromatography mass spectrometry (GC/MS)
- Matrix-assisted laser desorption/ionisation time-of-flight mass spectrometry (MALDI TOF)
- Atomic absorption spectroscopy both furnace and flame (AAS)

Contact Dr Lingzhi Gong
email l.gong@qmul.ac.uk
www.sbcs.qmul.ac.uk/facilities/Analytical_lab

Mass Spectrometry – Mile End – Please see Analytical Services above

Mass Spectrometry – Charterhouse Square (BCI)

Specialists in global proteomics and phosphoproteomics analyses, and targeted analyses of peptides, metabolites, and other small molecules.

- High-resolution mass spectrometers for untargeted analyses
 - LTQ-Orbitrap XL (coupled to nanoACQUITY LC)
 - -Q-TOF (coupled to microACQUITY LC)
- Triple quadrupole mass spectrometer for targeted analyses:
 - TSQ Vantage (coupled to Accela or nanoACQUITY LC)

Contact Dr Vinothini Rajeeve
email v.rajeeve@qmul.ac.uk
www.bci.qmul.ac.uk/research/lab-facilities/mass-spectrometry

Electron Paramagnetic Resonance (EPR) Spectroscopy – Mile End (SBCS)

For the mechanistic and structural study of natural occurring and engineered paramagnetic species - such as radicals and transition metals - in biological, chemical and materials science systems.

- X-/Q- and W-band EPR spectrometers (operating at 9.5/34 and 95 GHz respectively)
- Continuous wave, pulsed, ENDOR and ELDOR operations at all frequencies
- Tunable laser (410 – 2500 nm) for in-situ generation of transient paramagnetic species

Contact Dr Enrico Salvadori
email e.salvadori@qmul.ac.uk
www.sbcs.qmul.ac.uk/facilities/EPR_facility

Environmental Sciences – Mile End (SBCS)

For the analysis of ¹³C & ¹⁵N stable isotopes and environmental samples

- Isotope ratio mass spectroscopy coupled to an elemental analyser (IRMS)
- Gas chromatography headspace analysis (GC/ECD & FID)
- Automated Wet Chemistry Analyzer (SKALAR)

Contact Dr Ian Sanders
email i.a.sanders@qmul.ac.uk

Lipid Mediator Metabololipidomics Unit – Charterhouse Square (SMD)

Functional lipid mediator profiling. The Lipid Mediator Metabololipidomics Unit is dedicated to the identification and profiling of bioactive lipid mediators from a large variety of biological samples. In addition, the unit will also validate the integrity of lipid mediators to be used for biological experiments.

- AB SCIEX 5500
- Shimadzu LC-20ADXR HPLC System
- Shimadzu SIL-20AXR Autosampler
- Biotage ExtraHera
- Biotage TurboVap
- UV Spectrophotometer

Contact Dr Jesmond Dalli
email j.dalli@qmul.ac.uk

ANALYTICAL SERVICES/ SUBMOLECULAR SCIENCES

Nanovision – Mile End (SEMS)

Houses a number of microscopes allowing

- 2x Scanning Electron Microscopes (SEM), both with energy dispersive spectroscopy (EDS) of X-rays providing rapid chemical analysis of the sample, one also has wavelength dispersive spectroscopy (WDS) of X-rays for high resolution spectral analysis and electron backscattered diffraction (EBDS) for crystal orientation analysis. Dark field STEM detector available on both instruments. Cryo-SEM available on one instrument.
- Focused ion beam microscope (FIB-SEM) for sample manipulation including site-specific cross-sectioning and 3D imaging of soft matter such as cell tissue, with nanoscale resolution. Possible to also image at cryogenic samples.
- Environmental scanning electron microscope with incorporated WetSTEM detector for surface or transmission imaging samples at high resolution whilst remaining hydrated.
- Two Transmission EM (TEM) microscopes, one of which allows energy dispersive spectroscopy (EDS) of X-rays providing rapid chemical analysis of the sample, both with digital cameras for image capture and electron diffraction patterns
- Scanning Probe Microscopy (SPM), Atomic Force Microscopy (AFM), Scanning Tunnelling Microscopy (STM), Magnetic Force Microscopy (MFM), Electric Force Microscopy (EFM), Adhesion Force Imaging, Scanning Kelvin probe microscopy (SKM), Scanning Capacitance Microscopy (SCM)

Contact Dr Andy Bushby
email a.j.bushby@qmul.ac.uk
www.nanovision.qmul.ac.uk/about

Nuclear Magnetic Resonance (NMR) Spectroscopy – Mile End (SBCS)

For metabolomics, proteomics, enzyme kinetics and structural analysis

- Two 400 MHz spectrometer and one 600 MHz spectrometer
- 1D, 2D and 3D proton, carbon, fluorine, nitrogen and phosphorus experiments
- Solution and solid state

Contact Dr H Toms
email h.toms@qmul.ac.uk
www.sbcqs.qmul.ac.uk/facilities/High NMR

X-Ray Diffraction - Mile End (SEMS/SBCS)

Full analysis service covering materials science, solid state science, structural chemistry and structural biology

- Single Crystal Bruker Apex II X-ray diffractometer with dual Cu and Mo sources, equipped with both cryo-cooler and high pressure cell.
- PANalytical Xpert Pro X-ray Powder diffractometer for reflection and transmission equipped with Cu source, Anton Paar strip furnace (25 to 1600°C) and texture cradle.
- Siemens D5000 X-Ray Powder diffractometer (Cu source) set up for thin films or surface diffraction.
- PANalytical Empyrean X-ray Powder diffractometer with Ag source for PDF analysis in capillary mode. Equipped with cryo-cooler for low temperature data collection.

Contacts:

Single Crystal Diffraction: Mr Majid Motevalli
email m.motevalli@qmul.ac.uk

Powder Diffraction: Dr Rory Wilson
email r.m.wilson@qmul.ac.uk

Facility Director: Dr Isaac Abrahams
email i.abrahams@qmul.ac.uk
www.sbcqs.qmul.ac.uk/facilities/Xray diffraction facility

NUCLEIC ACIDS/GENETICS/ GENOMICS

Bioinformatics Unit – Charterhouse Square (BCI)

Providing expertise on:

- Building platforms for integration and management of complex cancer-omics datasets. (Examples: <http://pancreasexpression.org>, <http://bioinformatics.breastcancertissuebank.org>, <https://searchbreast.org>)
- Software development for functional annotation of novel and publically known SNPs (SNPNexus, www.snp-nexus.org) and –omics data analysis (www.o-miner.org)
- Analysis of array and next-generation sequencing (NGS) data obtained from various platforms
- Large scale meta-analysis on diverse cancer datasets (Gadaleta et al., 2011, Haider et al., Genome Medicine 2014)

Contact Dr Claude Chelala
email c.chelala@qmul.ac.uk
www.bci.qmul.ac.uk/research/bioinformatics

Genome Centre – Charterhouse Square (SMD)

For all genomics, transcriptomics and epigenetic studies

- Next generation sequencing – for the study of interactions and modifications to DNA. MeDIP-seq, ChIPSeq and Bisulphite NGS
- Arrays – genome wide association screens (GWAS), targeted custom SNP projects, global gene expression
- Capillary sequencer – short tandem repeat (STR) genotyping and multiplex ligation-dependent probe amplification (MLPA) analysis. Plasmid and PCR sequencing
- Real time PCR – SNP genotyping and individual gene quantification
- Pyrosequencer – epigenetic analysis – single site methyl cytosine analysis
- DNA and RNA extraction from most tissues

Contact Dr Charles Mein
email c.a.mein@qmul.ac.uk
www.smd.qmul.ac.uk/gc

Protein Production Facility – Mile End (SBCS)

- Gene cloning
- DNA extraction, DNA purification

Contact Dr Ruth Rose
email r.s.rose@qmul.ac.uk
www.sbcqs.qmul.ac.uk/facilities/Protein facility

Informatics Services – Mile End (SBCS)

- Cluster computer facilities - including a state-of-the-art HPC facility, designed to meet the needs of both high-mem/high-CPU compute and the more classic models
- In-house BLAST server and Galaxy installation
www.informatics.sbcqs.qmul.ac.uk

siRNA Screening Facility – Blizard Institute (SMD)

High-throughput siRNA and miRNA screens to investigate the genomes of mammalian cells

- Houses miRNA and full genome siRNA libraries
- Liquid handling robot and automated epifluorescence microscope

Contact Dr Luke Gammon, Dr Cleo Bishop
email l.gammon@qmul.ac.uk, c.bishop@qmul.ac.uk
www.blizard.qmul.ac.uk/research/core-facilities/sirna-screening-facility.html

Irys Genome Mapping Facility - Mile End (SBCS)

- High molecular weight DNA preparation
- Whole Genome Mapping on Bionano genomics' Irys system
- Data QC and conversion into standard file formats for analysis

Contact Mr Philip Howard
email philip.howard@qmul.ac.uk
www.sbcqs.qmul.ac.uk/facilities/Irys facility

PROTEIN BIOCHEMISTRY

Protein Analysis/Biochemistry

Electron Paramagnetic Resonance (EPR) Spectroscopy

- see page 5

Mass Spectrometry – see page 5

Nuclear Magnetic Resonance (NMR) Spectroscopy – Mile End (SBCS)

For metabolomics, proteomics, enzyme kinetics and structural analysis

- A 600 MHz spectrometer suitable for 1D, 2D and 3D proton, carbon, fluorine, nitrogen and phosphorus experiments

Contact Dr H Toms

email h.toms@qmul.ac.uk

[www.sbcs.qmul.ac.uk/facilities/High NMR](http://www.sbcs.qmul.ac.uk/facilities/High%20NMR)

Protein Production Facility – Mile End (SBCS)

- Recombinant, yeast and mammalian protein production (0.1 L to 8 L volumes)
- Purification of proteins and antibodies
- Crystallisation of proteins
- Expertise in oxygen free work, including a glove box
- Western blotting

Contact Dr Ruth Rose

email r.s.rose@qmul.ac.uk

[www.sbcs.qmul.ac.uk/facilities/Protein facility](http://www.sbcs.qmul.ac.uk/facilities/Protein%20facility)

X-Ray Diffraction - Mile End (SEMS/SBCS)

Full analysis service covering structural chemistry and structural biology

- Rigaku rotating anode generator with osmic mirrors, image plate, and cryo-cooler

Contact Mr Majid Motevalli

email m.motevalli@qmul.ac.uk

[www.sbcs.qmul.ac.uk/facilities/Xray diffraction facility](http://www.sbcs.qmul.ac.uk/facilities/Xray%20diffraction%20facility)

CELL AND MOLECULAR IMAGING

Blizard Advanced Light Microscopy Core Facility – Blizard Institute (SMD)

- Various epifluorescence microscopes
- Differential Interference contrast Microscopy (DIC) and Phase contrast for studying transparent specimens
- Time lapse microscopy with a chamber for experiments lasting over 3 hours Confocal microscopy with the ability to collect serial sections from thick specimens
- Confocal microscopy with the ability to collect serial sections from thick specimens
- Spinning Disk Confocal Microscopy for live cell confocal imaging
- 3D cell imaging and reconstruction
- Real time calcium imaging, FRET and FRAP
- Laser ablation microdissection (P.A.L.M.) for the removal of very small sections of tissues or cells
- Stereology Microscopy

Contact Dr Jan Soetaert

email j.soetaert@qmul.ac.uk

www.blizard.qmul.ac.uk/balm.html

Confocal Microscope – Mile End (SBCS)

- Leica SP5 microscope with laser lines for probe excitation between 355 nm and 633 nm
- Resonant scanner for applications such as calcium imaging in living tissue
- Spectra-Physics Mai Tai HP laser (690-1040 nm) for two-photon microscopy

Contact Dr Michaela Egertova

email m.egertova@qmul.ac.uk

[www.sbcs.qmul.ac.uk/facilities/Confocal microscope facility](http://www.sbcs.qmul.ac.uk/facilities/Confocal%20microscope%20facility)

In Vivo Molecular Imaging – Charterhouse Square (BCI)

Non-invasive, whole body imaging of small animals

- Optical imaging (bioluminescence and fluorescence)
- Radiolabelling of biomolecules for radionuclide imaging
- Radionuclide imaging – both single-photon emission tomography (SPECT) and positron emission tomography (PET)
- X-ray computerised tomography (CT)
- Magnetic resonance imaging (MRI)
- Ultrasound imaging (US)

Contact Dr Jane Sosabowski

email j.sosabowski@qmul.ac.uk

www.bci.qmul.ac.uk/index.php/research/lab-facilities/molecular-imaging

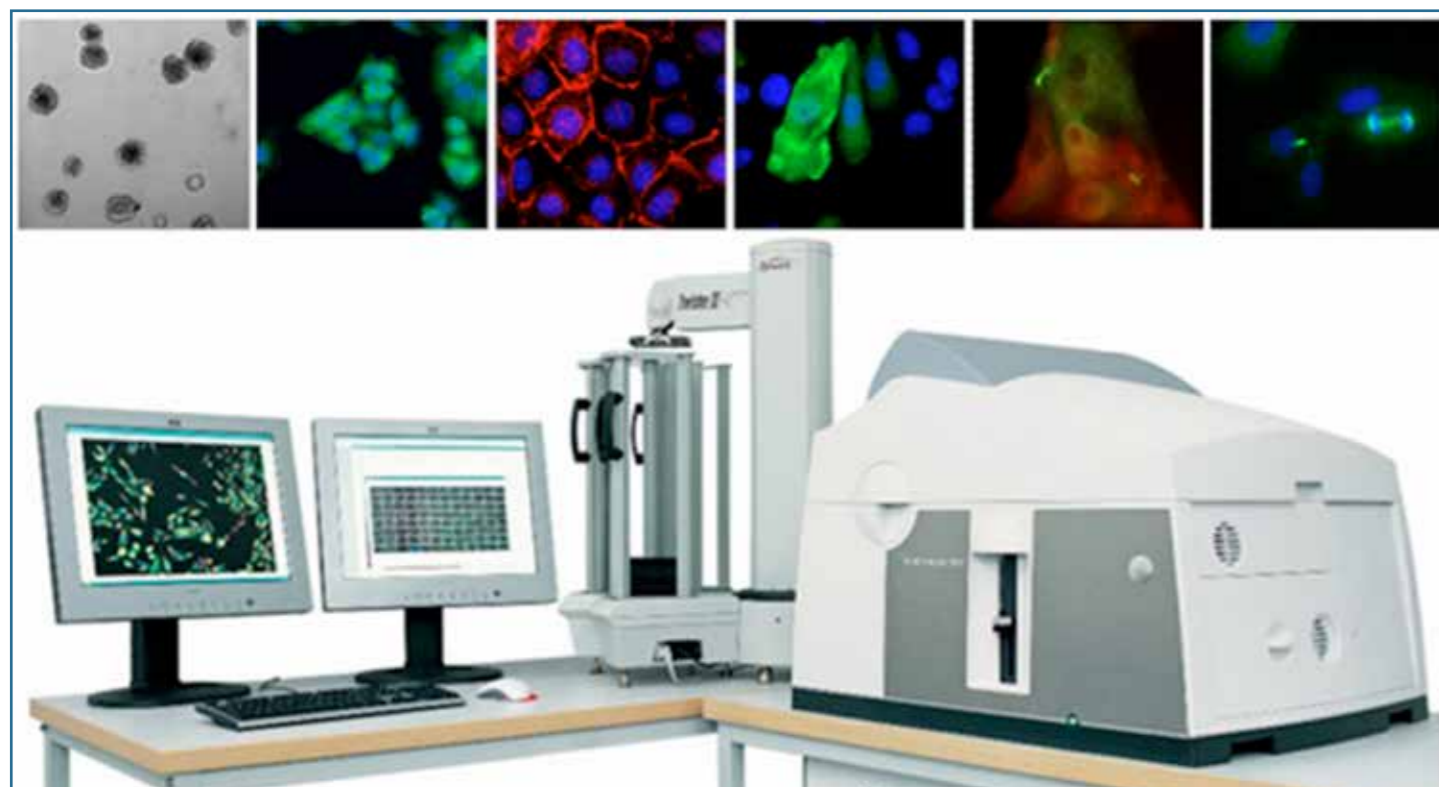
Microscopy Facility – Charterhouse Square (BCI)

- Two Zeiss confocal microscopes, each equipped with 4 lasers, inverted and fitted with incubation chambers for live imaging
- Ariol system for automated imaging of tissue microarrays or sections and quantification of immunohistochemical staining or immunofluorescence
- Panoramic 250 high throughput scanner for brightfield imaging of entire tissue microarrays or sections and subsequent analysis
- DeltaVision high resolution live imaging system equipped with fluorescence
- Time lapse system for sequential brightfield or fluorescence imaging of multiple, pre-defined locations over time
- P.A.L.M. Microbeam system for the microdissection and capture of specified tissue regions for subsequent extraction of DNA, RNA or protein
- SteREO Lumar V.12 for brightfield or fluorescence 3D observation and imaging of small objects
- Epifluorescence microscopes

Contact Dr Linda Hammond

email l.j.hammond@qmul.ac.uk

www.bci.qmul.ac.uk/index.php/research/lab-facilities/microscopy



CELL AND MOLECULAR IMAGING

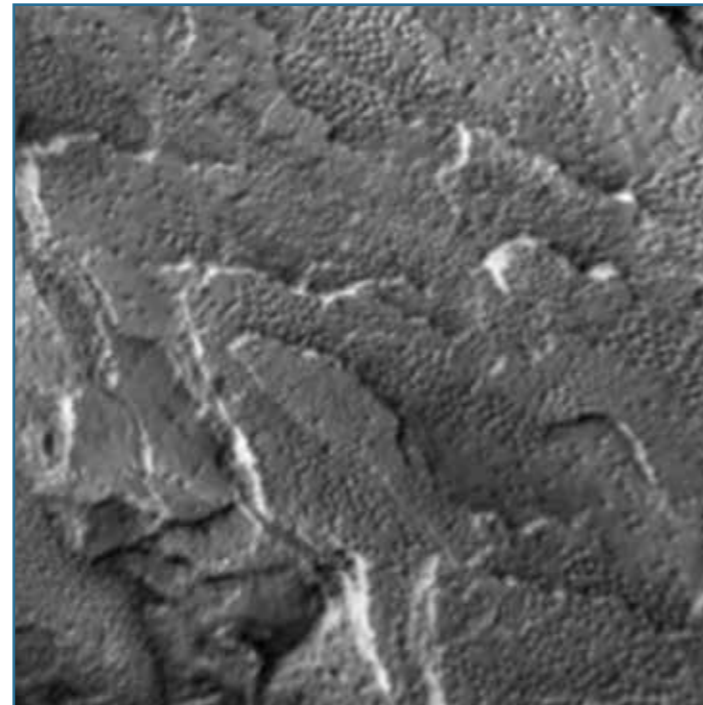
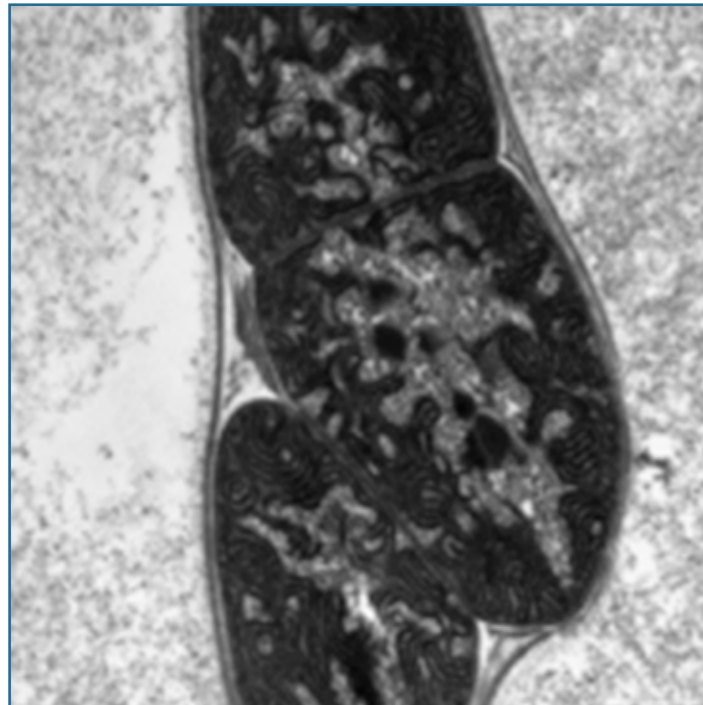
Transmission Electron Microscopy (TEM)

Facility – Mile End (SBCS - Nanovision)

The Transmission Electron Microscopy facility is dedicated to the ultrastructure analysis of a variety of biological samples. In addition, services are provided for materials science research such as polymers that require sample sectioning.

- Resin embedding and ultrathin sectioning for ultrastructure analysis
- Immunogold labelling experiments, specific procedure for individual sample
- Negative staining for a range of different samples in suspension
- Freeze-Fracture replication technique
- Ultrathin sectioning of polymers

Contact Ms Giulia Mastroianni
email g.mastroianni@qmul.ac.uk
www.sbcscs.qmul.ac.uk/facilities/tem/114718.html



WHOLE CELL/TISSUE

Breast Cancer Tissue Bank – Charterhouse Square (BCI)

Collection of breast tissue samples donated by patients across the UK

Contact Professor Louise Jones
email l.j.jones@qmul.ac.uk
www.bci.qmul.ac.uk/research/tissue-banks/breast-cancer-tissue-bank

Flow Cytometry

Quick and reliable analysis and separation of large quantities of cells and other substances by tagging them with fluorescent sources. Applications include cell phenotyping, apoptosis assays, cell cycle, DNA and RNA analysis and much more.

Flow Cytometry Facility – Blizard Institute (SMD)

- Five analysers with up to 4 lasers able to detect up to 16 fluorescent parameters
- Cell sorting service
- One three-colour LED upright fluorescent microscope

Contact Dr Gary Warnes
email g.warnes@qmul.ac.uk
www.icms.qmul.ac.uk/flowcytometry

Flow Cytometry Facility – Charterhouse Square (BCI)

- Five analysers with up to 4 lasers able to detect up to 16 fluorescent parameters
- Cell sorting service
- ImageStream X MkII Imaging Cytometer
- CyTOF2 Mass Cytometer

Contact Dr Becki Pike
email r.pike@qmul.ac.uk
www.bci.qmul.ac.uk/research/lab-facilities/flow-cytometry



Pathology – Blizard Institute (SMD)

- Processing, embedding and sectioning of frozen and fixed tissue
- Tinctorial stains
- Immunohistochemical (IHC) staining including antibody optimisation service
- Electron and light microscopy
- Scanning of stained slides

Contact Mr Christopher Evagora
email c.a.evagora@qmul.ac.uk
<http://blizard.qmul.ac.uk/core-facilities/pathology-core-facility>

Pathology – Charterhouse Square (BCI)

- Processing of human and mouse tissue
- Sectioning of paraffin and frozen tissues
- Haematoxylin and Eosin (H&E) staining (automated)
- Automated immunohistochemistry (IHC) staining using Ventana Discovery Classic and XT
- Optimisation of antibodies
- Scanning of stained sections on Panoramic 250 scanner
- Some special stains
- Hotel services for cryostat and microtome
- Training and advice

Contact Mr George Elia, Ms Emily Austin
email g.elia@qmul.ac.uk, e.austin@qmul.ac.uk
www.bci.qmul.ac.uk/index.php/research/lab-facilities/pathology

Zebrafish Facility – Mile End (SBCS)

- wild-type, mutant and transgenic zebrafish stock lines
- micro-injection
- genotyping
- behavioural assays

Contact Dr Andrew Fogel, Dr Caroline Brennan
email a.fogel@qmul.ac.uk, c.h.brennan@qmul.ac.uk
www.sbcscs.qmul.ac.uk/facilities/zebrafish

For more information on this publication:

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